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Physiological behavior of Hypocrea rufa.—MEDISCH[32] has made a physiological study dealing mainly with the factors influencing the production of pigment by *Hypocrea rufa*, and the behavior of the fungus toward ammonium salts, nitrates, and nitrites as sources of nitrogen. The conidia of this fungus are green when grown on alkaline media, while in acid media yellow conidia are produced. When the fungus is grown in liquid media containing only glucose, the pigment diffuses into the medium, while the mycelium remains colorless. The medium passes through shades varying from green to yellow, orange, and brown. Certain salts, as the chlorides of magnesium, sodium, and potassium, potassium chlorate, and magnesium sulphate, have a specific stimulating effect on the production of pigment. This stimulation is limited for all these salts to isotonic solutions varying from 0.05 to 0.125 gram-molecules per liter. No pigment is produced in the presence of ammonium salts of strong acids, owing to the accumulation of free acid. The pigment production is regarded as an oxidation process, as it takes place only in the presence of oxygen, and the colored solution can be decolorized by reducing substances like sodium sulphite, hydrogen peroxid, and sodium hydrogen sulphide. The addition of an excess of calcium carbonate, infusorial earth, kaolin, and similar substances, decreases the intensity of color, probably as a result of absorption. The fungus grows with either ammonium salts, nitrates, or nitrites as a source of nitrogen. Nitrates are reduced to nitrites. With ammonium salts of strong acids, growth is soon depressed, and the formation of conidia is inhibited. As the fungus has no invertase, it cannot use cane sugar; however, in the presence of ammonium salts cane sugar serves as a source of carbon, owing to its inversion by the liberated acid. When nitrites are given as the source of nitrogen, conidia are produced only in the light, except when levulose is present. In that case, a few conidia are produced also in the dark. Ammonium salts are utilized in preference to nitrates, and ammonium salts of organic acids in preference to those of stronger mineral acids. Experiments to determine if the fungus assimilates free nitrogen did not give definite results. The paper contains a great number of data on the interaction of various substances in nutrient media in which fungi are growing.—H. HASSELBRING.

Peroxidase and respiratory chromogens.—A number of experiments to test the various methods of preparing peroxidase have been performed by PALLADINE and IRAKLIONOFF,[33] who find that the best method with tissues containing small quantities of proteins, as watermelon, pumpkin, etc., is to extract with water or 10 per cent NaCl, and precipitate the proteins with saturated aqueous $HgCl_2$. The enzyme is then precipitated from the purified filtrate with 95 per cent alcohol. The best solvent of the precipitated enzyme is K_2HPO_4. From their experiments they further conclude that peroxidase occurs in some plants as enzyme, in others as zymogen, and that the quantity present in different plants varies considerably. The smallest quantity in any of the plants studied was found in *Aspergillus niger* and the Saccharomycetes. A suggestion is made in this connection which is very important if true. They think it probable that yeasts are capable of producing alcoholic fermentation even in the presence of free oxygen because they contain very little or no oxidizing enzymes. The experimental evidence for this view is too slender as yet to be considered seriously; but if it proves to be true, it will clear up the relation of fermentation to the respiratory process.

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[32] MEDISCH, MARC, Beiträge zur Physiologie der *Hypocrea rufa* (Pers.). Jahrb. Wiss. Bot. **48**:591–631. 1910.

[33] PALLADINE, W., and IRAKLIONOFF, P., La peroxydase et les pigments respiratoires chez les plantes. Rev. Gén. Botanique **23**:225–247. 1911.

The quantitative distribution of peroxidase and the respiratory chromogens shows a direct correlation, tissues rich in peroxidase containing much of the chromogens, and *vice versa*. Moreover, the tissues of plants are found to contain substances which are conceived to "stimulate" the color reactions used in detecting peroxidase. The products of alcoholic fermentation, which are rich in oxidizable substances, are placed among these stimulators of the formation of respiratory pigments. Finally, boiling of aqueous extracts containing chromogens is believed to render the formation of pigments impossible, either by changing profoundly the chemical nature of the chromogens, or by destroying the substances which stimulate the formation of the respiratory pigments which are produced by the action of such substances as emulsine and peroxidase on the chromogens. Most of the conclusions and suggestions seem to rest on a minimum of experimental evidence.—CHARLES A. SHULL.

The flora of Newfoundland.—The report of a botanical expedition to Newfoundland by FERNALD[34] includes the mention of many additions to the flora of the island, which is now known to possess 783 indigenous species. An inquiry into their geographical origin shows that about 60 per cent are boreal, including 28 per cent common to southern Labrador and eastern Canada. An additional 3.5 per cent are Canadian types not found in Labrador. A surprisingly large number of species are southwestern types found also in Nova Scotia, New Brunswick, and coastal New England, but unknown or rare in Quebec and Ontario. This class contains 274 species, or 35 per cent of the Newfoundland flora. At present 16 endemic plants are known, comprising 2 per cent of the flora.

To explain the abundance of plants identical with those of the Atlantic seaboard south of Newfoundland, the writer postulates the former existence of a bridge formed by an elevated coastal plain, composed of siliceous soils, connecting the island with Cape Breton and forming an ideal highway for the northeastward advance of plants which thrive on such soil. This siliceous bridge, according to the writer, would have been highly unattractive to such

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[34] FERNALD, M. L., A botanical expedition to Newfoundland and southern Labrador. Rhodora **13**:109–162. 1911.